REMARKS

Applicant hereby adds claim 93. Accordingly, claims 69-93 are pending in the present application.

Claims 69-90 stand rejected under 35 U.S.C. 103(a) for obviousness over U.S. Patent No. 5,448,110 to Tuttle et al. in view of U.S. Patent No. 5,552,790 to Gunnarsson. Claims 91-92 stand rejected under 35 U.S.C. 103(a) for obviousness over Tuttle et al. in view of Gunnarsson and further in view of U.S. Patent No. 5,859,587 to Alicot et al.

Applicant respectfully traverses the rejections and urges allowance of the present application.

Applicant files a Terminal Disclaimer herewith and respectfully requests withdrawal of the obviousness-type double patenting rejection in view of this filing.

Referring to the rejection of claim 69, Applicant submits that the Office has failed to present a *prima facie* case of obviousness and claim 69 is in condition for allowance. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See, e.g., MPEP §2143 (8th ed.). There is no motivation to combine the reference teachings and claim 69 is allowable for at least this reason.

The Office on pages 2-3 of the Office Action states that Gunnarson discloses a

device with a more directive and enhanced communication signal. Thereafter, it is alleged that for applications where a more directive communication is desired or acceptable that it would have been obvious to provide a reflective ground plane of Gunnarson inside an encapsulated package of Tuttle. Applicant disagrees and asserts that such position of the Office clearly illustrates the inappropriate nature of the 103 rejection.

Initially, Tuttle is replete with teachings that Tuttle is directed towards and concerned with *omnidirectional* transceiver arrangements. Accordingly, there is absolutely no motivation to combine the Gunnarson *directional* communication teachings with the *omnidirectional* teachings of Tuttle. Without proper motivation, the Office has failed to establish a proper 103 rejection and claim 69 is in condition for allowance.

Referring to Tuttle, it is provided at col. 2, lines 9-12 that there is a recognized need to provide a device operable over distances of several hundred feet *without regard for the special orientation of the enclosure*. Thereafter, Tuttle provides numerous teachings to satisfy this need. For example, at col. 4, lines 58-60 it is stated that the *transceiver is arranged for omnidirectional communication and no manual manipulation of the interrogator or transceiver is required for area-wide communication*. At col. 6, lines 55-63 it is stated that loop antenna 19 provides near omnidirectional communication capability and the battery ***improves*** *the omnidirectional nature of the antenna pattern*. There is no evidence of record to support the combination of the inapposite directional teachings of Gunnarson with the omnidirectional teachings of Tuttle. The only arguments in favor of combining the reference teachings are the subjective opinions of the Examiner which are

deficient to support a 103 rejection especially in consideration of the inapposite express teachings of the references.

More specifically, the Federal Circuit discussed proper motivation *In re Lee*, 61 USPQ 2d 1430 (Fed. Cir. 2002). The motivation identified in the Office Action is akin to the conclusory statements set forth in *In re Lee* which were found to fail to provide the requisite motivation to support an obviousness rejection. The Court in *In re Lee* stated the factual inquiry whether to combine references must be *through and searching*. It must be based *on **objective** evidence of record*. The Court in *In re Fritch*, 23 USPQ 2d 1780, 1783 (Fed. Cir. 1992) stated motivation is provided only by showing some *objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art* would lead that individual to combine the relevant teachings of the references. The *Lee* Court stated that the Examiner's *conclusory statements* in the *Lee* case do not adequately address the issue of motivation to combine. The Court additionally stated that the factual question of motivation is material to patentability and ***can not be resolved on subjective belief and unknown authority. The Court also stated that deficiencies of cited references cannot be remedied by general conclusions about what is basic knowledge or common sense. The Court further stated that the determination of patentability must be based on evidence.***

In the instant case, ***the record is entirely devoid of any evidence to support motivation to combine the teachings apart from the bald conclusory statements of the Examiner which are insufficient for proper motivation*** as set forth by the Federal

Circuit. The Office cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims but must set forth objective rationale on which it relied.

Applicant submits that statements set forth in the present Office Action are akin to the alleged improper motivation discussed *In re Lee* and accordingly are insufficient to combine the reference teachings. In addition, the inapposite nature of the reference teachings further underscores the improper nature of the obviousness rejection. The only motivation presented in the Office Action is based upon ***the Examiner's subjective belief or unknown authority which is insufficient as clearly held by the applicable authority***. As set forth by the Federal Circuit, there is no motivation and the Office Action has failed to establish a prima facie case of obviousness and accordingly the 103 rejection is improper.

Applicant asks why would one aware of the teachings of Tuttle concerning omnidirectional teachings look to Gunnarson for inapposite teachings directed to directional communications? The answer in view of the lack of any supporting objective evidence is the motivation can only result from improper reliance upon Applicant's disclosure. However, the motivation for forming the combination must be something other than hindsight reconstruction based on using Applicant's invention as a road map for such a combination. *See, e.g., Interconnect Planning Corp. v. Feil*, 227 USPQ 543, 551 (Fed. Cir. 1985); *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990). The 103 rejection is improper for at least this reason.

To further illustrate the improper nature of the 103 rejection, Tuttle at col. 8, lines 20-25 teaches folding a cover 42 to fabricate the devices. Also, Tuttle teaches packages having a stamp sized form factor with minimal thickness. There is absolutely no evidence of record that if Tuttle were modified per Gunnarson (as asserted by the Office of providing the ground plane within an encapsulated package on page 3 of the Action) that the folding manufacturing process could even be implemented or that a device having the desired form factor would result. Tuttle further describes at col. 11, lines 15-45 manufacturing processes wherein devices may be formed on a web and stored on a take-up reel. There is no evidence of record that if Tuttle where modified per Gunnarson to include different metal and insulating layers in the package that the resultant devices would be flexible to meet the manufacturing aims of Tuttle including the ability to be formed on a web and rolled on a take-up reel.

In sum, there is no evidence of record that Tuttle is concerned with providing a directional transceiver, and in fact, the express teachings of Tuttle clearly illustrate the desire for a omnidirectional arrangement. Tuttle provides a solution for the need of avoiding directional devices. To modify Tuttle according to the teachings of Gunnarson would clearly defeat the solution contrary to the Tuttle teachings illustrating the lack of motivation and the improper nature of the obviousness rejection. There is no motivation to combine the reference teachings and the 103 rejection of claim 69 is improper for at least the above numerous and compelling reasons and Applicant requests allowance of claim 69 in the next Action.

The claims which depend from independent claim 69 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 72, the Office properly recognizes the deficiencies of the art with respect to the teaching of the power source coupled with the ground plane. Thereafter, the Office presents a faulty prima facie rejection of claim 72. In particular, even if the references are combined (which is improper for lack of motivation), the combination of reference teachings fails to provide any teaching or suggestion of *coupling the ground plane with a power source* as claimed and claim 72 is allowable for at least this reason.

Page 5 of the Action states that "by definition" the ground plane is either at ground or floating voltage and that the ground voltage can be implemented by connection/coupling to the ground terminal of the transponder circuit including the power source. Applicants disagree. In particular, the Office erroneously equates floating voltage with ground voltage in the rejection of claim 72. In particular, a floating voltage "floats" whereas a ground voltage is clearly tied to a ground reference voltage level. Applicant submits herewith definitions of "floating" and "ground" for the convenience of the Office and to illustrate the erroneous nature of the rejection of claim 72. In particular, Applicant notes that the definition of "floating" is *not grounded.*

Fundamentally, the prior art is devoid of any teaching of suggestion of coupling a ground plane with a power source as claimed. There is no teaching, suggestion or motivation in the prior art or otherwise to couple the ground plane with a power source. If

a floating voltage is acceptable in the arrangement of Gunnarson (as alleged by the Office by stating that the ground plane by definition may be floating), why would one couple the ground plane with a power source as specifically claimed by Applicant? There is no reason or motivation from the teachings of the art or otherwise and the only motivation improperly results from improper usage of Applicant's disclosure as a roadmap. The rejection of claim 72 is improper for at least this reason.

The rejection of claim 72 relies upon personal knowledge of the Examiner inasmuch as there is absolutely no support in the art for the rejection of claim 72. However, inherency is not appropriate inasmuch as the Office admits that an alternative (i.e., floating) exists. Applicants hereby request identification of prior art which discloses claimed limitations not found in the references of record or the submission of an affidavit in support of any rejection of the claims in *a non-final Action* if claim 72 is not allowed. "[A]ssertions of technical facts in areas of esoteric technology must always be supported by citation of some reference work" and "allegations concerning specific 'knowledge' of the prior art, which might be peculiar to a particular art should also be supported." *In re Ahlert*, 424 F.2d 1088, 165 USPQ 418, 420-421 (CCPA 1970). Also, the undersigned hereby traverses and seasonably challenges any assertion that the prior art of record discloses or suggests that a ground plane is coupled with a power source pursuant to MPEP §2144.03 (8th ed.), and requests the Examiner cite a reference in support of his or her position. Applicant believes reasonable doubt exists regarding the Examiner's assertion of judicial notice. The Examiner is reminded that the facts constituting the state of the art

are normally subject to the possibility of rationale disagreement among reasonable men and are not amenable to the taking of judicial notice. See *In re Eynde*, 480F.2d 1364, 1370, 178 USPQ 470, 474 (CCPA 1973). The Examiner is also reminded that claims are analyzed in the context of the combination of the various separately stated limitations, and not with respect to the limitations individually. Pursuant to MPEP §2144.03 (8th ed.), Applicant hereby demands evidence with respect to what the Examiner apparently relies upon as being "well-known." Claim 72 is allowable for at least the above-numerous reasons.

Referring to claim 75, there is no motivation to combine the reference teachings in support of the rejection of claim 75 and the 103 rejection is improper for at least this reason.

Even if the reference teachings are combined, the combination fails to disclose or suggest limitations of claim 75. More specifically, the Office recites on page 5 of the Action teachings of the prior art which allegedly disclose limitations of claim 75. However, notably, the Office fails to identify any prior art teachings which allegedly disclose *the ground plane being further configured to electrically couple with a terminal of a power source and provided at a voltage of the terminal* as specifically claimed. The prior art is devoid of any teaching or suggestion of an electrically coupled ground plane and terminal. In addition, the Office fails to present any argument as to why such limitations of claim 75 are inherent, well known, or otherwise disclosed by the art. Accordingly, the Office has failed to establish a proper 103 rejection of claim 75 for this additional reason because even if the

references are combined, limitations are not taught or suggested by the art, and there is no motivation to combine the prior art relied upon in support of the rejection of claim 75. Claim 75 is allowable for the above compelling reasons.

In the event that a rejection of the claims is maintained with respect to the prior art, or a new rejection made, Applicants respectfully request identification *in a non-final action* of elements which allegedly correspond to limitations of the claims in accordance with 37 C.F.R. §1.104(c)(2). In particular, 37 C.F.R. §1.104(c)(2) provides that *the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.* Further, 37 C.F.R. §1.104(c)(2) states that the Examiner must cite the best references at their command. When a reference is complex or shows or describes inventions other than that claimed by Applicants, the particular teachings relied upon must be designated as nearly as practicable. The pertinence of each reference if not apparent must be clearly explained for each rejected claim specified. Applicants respectfully request clarification of the rejections with respect to specific references and specific references teachings therein pursuant to 37 C.F.R. §1.104(c)(2) in a *non-final Action* if any claims are not found to be allowable.

The claims which depend from independent claim 75 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 79, there is no motivation to combine the reference teachings in support of the 103 rejection and the rejection of claim 79 is improper for at least this

reason. Even if the references are combined, the combination fails to disclose or suggest limitations of claim 79 and claim 79 is allowable for this additional reason. The prior art fails to disclose and the Office fails to recite any teaching or suggestion in the art of the claimed *electrically coupling the ground plane with the power source to electrically ground the ground plane* as specifically defined in claim 79. In addition, the Office vaguely states that limitations of claim 79 are disclosed "throughout the disclosure" of Tuttle. Applicant submits that the rejection of claim 79 fails to meet the specificity requirements of the CFR discussed above and Applicant requests that the Office issue a non-final Action to cure the deficiencies of the rejection of claim 79 if claim 79 is not allowed. In particular, in addition to the above recited limitation, Applicant requests clarification/identification of the reference teachings relied upon as allegedly disclosing the claimed *conductively bonding of the integrated circuit and the antenna*. Claim 79 is allowable for at least the above numerous reasons.

The claims which depend from independent claim 79 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

With respect to claim 80, Applicant respectfully requests clarification of any rejection of such claim in a non-final action in accordance with the CFR if claim 80 is not allowed inasmuch as the Action fails to recite any teachings which allegedly disclose or suggest the *conductively bonding of the integrated circuit with the ground plane* as claimed.

Referring to claim 83, there is no motivation to combine the teachings of Gunnarrsson with the teachings of Tuttle. The 103 rejection is improper for at least this reason. Applicant requests allowance of claim 83 in the next Action for at least this reason.

The claims which depend from independent claim 83 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

For example, claim 85 recites *printing at least one conductive connection through a dielectric layer while printing the antenna*. The Office fails to recite any limitations which allegedly correspond to the explicitly claimed limitation of printing the antenna or printing the conductive connection through any dielectric layer while printing the antenna as claimed and the prior art fails to teach such limitations. Accordingly, even if the references are combined, the combination fails to teach or suggest limitations of claim 85 and claim 85 is allowable for at least this reason.

In accordance with the CFR, Applicant respectfully requests identification in a non-final Action of reference teachings of the prior art which allegedly disclose or suggest the limitations of claim 85 so Applicant may appropriately respond. In particular, Tuttle fails to disclose or suggest a conductive connection through a dielectric layer as claimed let alone that the conductive connection is printed during the printing of the antenna. Claim 85 is in condition for allowance.

Referring to claim 88, there is no motivation to combine the teachings of Gunnarsson with the teachings of Tuttle. The 103 rejection is improper for at least this

reason. Applicant requests allowance of claim 88 in the next Action for at least this reason.

Also, the Office has failed to establish a proper prima facie rejection against claim 88 inasmuch as positively recited limitations of claim 88 are not disclosed nor suggested by the prior art even if the references are combined.

Claim 88 recites providing an encapsulant to form a device comprising a *substantially void-free mass*. The prior art is devoid of disclosing or suggesting provision of an encapsulant to form the device comprising a substantially void-free mass as claimed even if the references are combined. Applicant has electronically searched Tuttle and has failed to uncover any teachings directed to a void-free mass. Limitations of claim 88 are not shown nor suggested by the prior art and claim 88 is allowable for at least this reason.

According to the CFR, Applicant respectfully requests identification of specific reference teachings relied upon in support of the rejection in a non-final Action if claim 88 is not allowed. In particular, the "throughout the disclosure" recitation of the Office Action fails to comply with the specificity requirement of the CFR. Applicant respectfully requests allowance of claim 88 in the next Action.

The claims which depend from independent claim 88 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

For example, claim 90 recites flowing the flowable encapsulant over the antenna and the integrated circuit. The Office Action identifies reference 58 as allegedly teaching the flowable encapsulant. However, col. 8, lines 45-50 of Tuttle disclose reference 58 as

a stiffener applied over the IC 32 and not the antenna. Accordingly, even if the references are combined, the combination fails to disclose or suggest limitations of claim 90 and claim 90 is allowable for at least this reason.

Support for the new claim is found at least at Figs. 4-7 and the associated specification teachings of the originally filed application.

Applicant notes that references AI and AK of sheet 1 and references AA, AB, AI, AK and AL of sheet 2 have not been initialed on the forms PTO-1449 filed November 20, 2001. Applicant respectfully requests initialization of the references (copies enclosed for the Examiner's convenience) and return of the initialed forms to Applicant indicating full consideration of the references by the Examiner in compliance with obligations set forth in MPEP §609 (8th ed.). Also, Applicant includes a copy of the IDS filed January 22, 2004 which includes references which have not been initialed by the Examiner. Applicant respectfully requests a telephone call or other indication from the Examiner as to why the references have not been initialed prior to the issuance of a Notice of Allowance or Final Office Action so Applicant can properly respond to have such references considered during the prosecution of this application.

Applicant respectfully requests allowance of all pending claims.

The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: 6/3/04 By: _____

James D. Shaurette
Reg. No. 39,833

About the Authors

NEIL SCLATER began his career as a microwave components engineer before turning to writing and editing. He first became an editor for *Electronic Design* magazine and then *Product Engineering* magazine before becoming a regular contributor to *Electronic Engineering Times*, *Electronic Buyers News*, and many other publications.

As a consultant in marketing communications for more than 25 years, he has served a varied list of clients that includes many electronics manufacturers, publishers, and public relations agencies.

He is the author of the fifth and sixth editions of this dictionary, as well as the author or coauthor of six other books. Of these, *Gallium Arsenide IC Technology*, *Electrostatic Discharge Protection for Electronics*, *Wire and Cable for Electronics*, and *The Encyclopedia of Electronics* (Second Edition, coauthor) were published by McGraw-Hill.

The late JOHN MARKUS was a professional writer who had a long association with McGraw-Hill and was the author of many of its best-selling technical books. He was a feature editor of *Electronics* magazine before serving as a technical director for the McGraw-Hill Book Company, responsible for developing new methods for publishing and information retrieval.

He was the author or coauthor of the first four editions of this dictionary, as well as the author, coauthor, or editor of books including *Television and Radio Repairing*, *How To Make More Money in Your TV Servicing Business*, *Sourcebook of Electronic Circuits*, *Electronics Circuits Manual*, and *Guidebook of Electronic Circuits*, all published by McGraw-Hill. Mr. Markus died in 1982.

McGRAW-HILL ELECTRONICS DICTIONARY

SIXTH EDITION

NEIL SCLATER
JOHN MARKUS

McGraw-Hill
New York San Francisco Washington, D.C. Auckland Bogotá
Caracas Lisbon London Madrid Mexico City Milan
Montreal New Delhi San Juan Singapore
Sydney Tokyo Toronto

Library of Congress Cataloging-in-Publication Data

Sclater, Neil.
McGraw-Hill electronics dictionary / Neil Sclater, John Markus. — 6th ed.
p. cm.
Markus' name appears first on the earlier edition.
Includes index.
ISBN 0-07-057837-0
1. Electronics—Dictionaries. I. Markus, John, 1911–
II. Title.
TK7804.M354 1997
621.38'03—dc21 97-16168
CIP

2 3 4 5 6 7 8 9 0 DOC/DOC 9 0 2 1 0 9 8 7

ISBN 0-07-057837-0

The sponsoring editor for this book was Steve Chapman, the editing supervisor was M. R. Carey, and the production supervisor was Clare Stanley. It was set in Times Roman by North Market Street Graphics.

Printed and bound by R. R. Donnelley & Sons Company.

Co

Preface

McGraw

voltage between the receiver matrix and the green-gun grid of a three-gun color television picture tube.

Greenwich mean time [GMT] The former name for universal time (UT).

Grenz ray Long wavelength X-rays (1 to 10 Å) produced by special low-voltage X-ray tubes operating from 5- to 15-kV power supplies. These weak X-rays are suitable for skin therapy and radiography of biological specimens.

Grenz tube A low-voltage X-ray tube that has a special glass window capable of transmitting X-ray wavelengths ranging from 1 to 10 Å. These rays are blocked by ordinary glass.

grid 1. An electrode located between the cathode and anode of an electron tube with one or more openings through which electrons or ions can pass under certain conditions. A grid controls the flow of electrons from cathode to anode. 2. A network of equally spaced lines forming squares, for determining permissible locations of holes on a printed-circuit board or a chassis. 3. *Potter-Bucky grid.*

grid bearing A bearing that has a reference line of grid north.

grid control The control of anode current of an electron tube by varying the voltage of the control grid with respect to the cathode.

grid current Electron flow to a positive grid in an electron tube.

gridded tube A high-power, high-frequency, grid-controlled vacuum tube that provides wideband linear amplification.

grid detection Detection in the grid circuit of a vacuum tube, as in a grid-leak detector.

grid dissipation The power lost as heat at the grid of an electron tube.

grid-drive characteristic A relation between electric or light output of an electron tube and the control-electrode voltage, as measured from cutoff.

grid driving power The average product of the instantaneous value of the grid current and the alternating component of the grid voltage of an electron tube over a complete cycle.

grid emission Electron or ion emission from a grid of an electron tube.

grid-glow tube A glow-discharge tube with one or more control electrodes that initiate but do not limit the anode current except under certain operating conditions.

grid limiting Limiting action achieved by placing a high-value resistor in series with the grid of a vacuum tube. The voltage drop across this resistor increases with input signal strength, giving a varying negative grid bias that serves to level input signals which are above a certain value.

grid modulation Modulation produced by feeding the modulating signal to the control-grid circuit of any electron tube in which the carrier is present.

ground [gnd] 1. A conducting path, intentional or accidental, between an electric circuit or equipment and the earth, or some conducting body serving in place of the earth. Also called earth (British). 2. The lowest energy state of a nucleus, atom, or molecule. All other states are excited.

ground absorption Energy loss caused by dissipation of radio waves in the ground during transmission.

ground clamp A clamp that connects a grounding conductor to a grounded object.

ground clutter Clutter on a ground or airborne radar caused by the reflection of signals from the ground or objects on the ground. It is also called ground return.

ground control Control of an aircraft or missile in flight by a person on the ground.

ground-controlled approach [GCA] An airport ground radar system that provides information to aircraft making approaches for landings. It consists of an airport surveillance radar for guiding the aircraft to the start of the final approach path and a precision approach radar for showing the exact position of the aircraft on its final approach path.

ground-controlled interception [GCI] A radar system that permits a controller at a ground or ship radar to direct an aircraft by radio to make an interception of another aircraft.

ground distance The mean sea-level great-circle component of distance from one point to another.

grounded Connected to earth or to some conducting body that serves in place of the earth. Also called earthed (British).

grounded-base amplifier See *common-base amplifier.*

grounded-cathode amplifier See *common-cathode amplifier.*

grounded-collector amplifier See *common-collector amplifier.*

grounded-drain amplifier See *common-drain amplifier.*

grounded-emitter amplifier See *common-emitter amplifier.*

grounded-gate amplifier See *common-gate amplifier.*

grounded-grid amplifier See *common-grid amplifier.*

grounded-source amplifier See *common-source amplifier.*

ground environment 1. The entire complement of equipment installed on the ground to make up a communication or electronic system, facility, or station. 2. The environment that surrounds and affects a system or equipment operating on the ground.

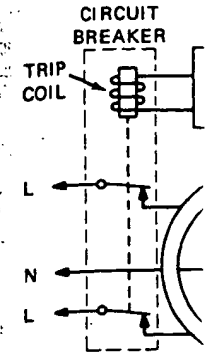
ground-equalizer coil A coil with relatively low inductance that is placed in one or more of the circuits connected to the grounding points of an antenna to distribute the current to the various points in a desired manner.

ground fault Accidental grounding of a conductor.

ground-fault interrupter [GFI] A fast-acting circuit breaker that also senses very small ground-fault currents such as might flow through the body of a person standing on damp ground while touching a hot AC line wire. The interrupter limits the time the current can flow through the fault by tripping the circuit breaker in as little as 0.025 s; this limits the total energy flow through the human body to a safe value. A typical trip current setting for homes is 5 mA.

ground-fault interrupter IC A monolithic integrated circuit version of a *ground fault interrupter* circuit. It contains Zener diodes and an operational amplifier and can detect when a short-circuit or fault closes a magnetic path between external coils. The AC coupling through the external coils triggers oscillations which opens a relay when their voltage exceeds a threshold value, which, in turn, opens a power-line relay.

grounding outlet An outlet that has, in addition to the current-carrying contacts, one grounded contact that can be used for grounding portable appliances and equipment.



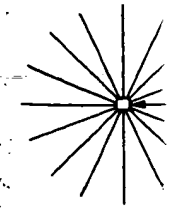
Ground-fault interrupter with in line wires L are normally ze zero. When a fault path occurs N sensor reacts to the grou breaker.

grounding plate An elec which a person stands to up by his body, or a simi act as a ground rod.

ground loop A conditio ponents share a comn unwanted (spurious) volt A circuit that has more t to earth ground, with ground potential produ ground system. These un be avoided by connectir earth ground with only o

ground noise The residu the signal in recording a

ground plane A ground pose, or arrangement of a ground-mounted ante the return path for radia



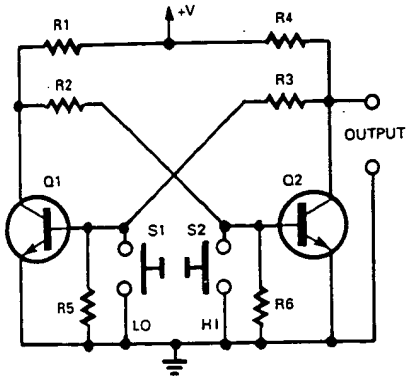
Ground plane consisting of h wavelength long at the lowest

ground-plane antenna vertical radiator mounte ical radiator is a mon length of the operating slightly longer than on horizontally. It can be fe with the energized cond

surface, but it is insignificant at most semiconductor operating frequencies.

flip chip A semiconductor die with all terminations on one side in the form of solder pads or bump contacts. After the surface of the chip has been passivated or otherwise treated, it is flipped over for attaching to a matching substrate on which interconnecting thin films and possibly also thin-film components have previously been deposited. All connections are then made simultaneously by applying heat or a combination of ultrasonic energy and pressure.

flip-flop circuit A two-stage multivibrator circuit that has two stable states. In one state, the first stage is conducting and the second is cut off. In the other state, the second stage is conducting and the first stage is cut off. A trigger signal changes the circuit from one state to the other, and the next trigger signal changes it back to the first state. For counting and scaling purposes, a flip-flop can deliver one output pulse for each two input pulses. It is also known as a bistable multivibrator, Eccles-Jordan circuit, or trigger circuit. See also *D flip-flop, J-K flip-flop, R-S flip-flop* and *T flip-flop.*



Flip-flop circuit is a bistable multivibrator; also known as an Eccles-Jordan, or binary circuit. It can function as a simple digital memory.

FLIR An abbreviation for *forward-looking infrared unit.*

floating The condition wherein a device or circuit is not grounded and not tied to an established voltage supply.

floating address *Symbolic address.*

floating-average-position action Floating action in which there is a predetermined relation between deviation of the controlled variable and the rate of change of the time-average position of a final control element that is moved periodically from one of two fixed positions to the other.

floating battery A storage battery connected permanently in parallel with another power source. The battery normally handles only small charging or discharging currents, but it can take over the entire load upon failure of the main supply.

floating-carrier modulation *Controlled-carrier modulation.*

floating charge Application of a constant voltage to a storage battery, sufficient to maintain an approximately constant state of charge while the battery is idle or on light duty.

floating grid An electron-tube grid that is not connected to a circuit. The grid assumes a negative potential with respect to the cathode, due to electrons hitting the grid wires, and the tube is then sensitive to external effects such as movement of a hand near the envelope. Also called free grid.

floating input An amplifier or other circuit in which no input terminal is connected to circuit ground.

floating junction A transistor junction through which the average current is zero.

floating output A circuit output that is not grounded or referenced to another output.

floating point Pertaining to a number system in which the location of the point does not remain fixed with respect to one end of the numerals.

floating-point arithmetic A method of calculation that automatically accounts for the location of the decimal or radix point.

floating-point calculation A computer calculation in which provisions are made for varying the location of the decimal point (if base 10) or binary point (if base 2).

floating-point routine A computer routine that permits floating-point operation for a specific problem.

floating-point system A point system of positional notation in which the position of the point is regularly recalculated and can be moved. A floating-point system usually locates the point by expressing a power of the base, and involves the use of two sets of digits. For floating decimal notation the base is 10, so 6,200,000 would be 6.2, 6. For floating binary notation the base is 2, so 88 would be 11, 3.

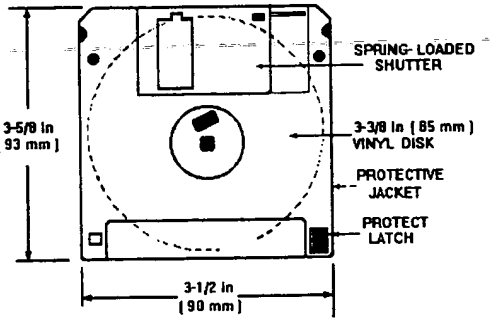
float switch A switch actuated by a float at the surface of a liquid.

flood To direct a large-area flow of electrons toward a storage assembly in a charge storage tube.

floodlighting Covering a wide area with radar waves.

floppy disk (or **diskette**) A magnetic memory medium for personal computers made as a double-sided flexible Mylar disk that has been coated with a ferrite magnetic compound. Each side is organized as concentric circles, called *tracks,* and each track is divided into *sectors.* There are 512 bytes of information in each sector of the standard 3.5-in diameter double-density disk. It is contained within a rigid square plastic protective jacket with a spring-loaded shutter. One read/write head of the *floppy-disk drive* contacts each side of the disk to write and read data when the shutter is opened. The 3.5-in disk has a formatted capacity of 1.44 Mbytes. The earlier 5.25-in floppy disk is now obsolete.

floppy-disk drive An electromechanical computer peripheral component for reading and writing data to a *floppy*



Floppy disk is a magnetically coated vinyl disk within a plastic protective jacket. The reverse side of a 3½ in disk with 1.44 Mb capacity is shown.